

but along the whole coast these normal ground-water relationships may be disturbed by the admixture of more or less sea water with the normal ground waters.

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BOTANY.—*New species of Sphaceloma on Aralia and Mentha*.¹

ANNA E. JENKINS, Bureau of Plant Industry. (Communicated by JOHN A. STEVENSON.)

Four new American species of *Sphaceloma* were listed in a synoptic table (table 1) included in a paper presented at Rio de Janeiro, in January, 1936, giving the known species of *Elsinoe* and *Sphaceloma*.² Names and brief descriptions of the two North American species are here supplied. The two from South America will be named and described elsewhere.

Sphaceloma araliae sp. nov.

Produces conspicuous spots or galls on stems and leaves, including midrib and veins; spots solitary or closely grouped, linear to elliptical or elongate, or, particularly on leaves, circular to irregular, up to 12 mm long by 5 mm wide, ocher red,³ becoming pale ochraceous buff in central region; acervuli erumpent superficial, 20–50 μ in diam., often continuous over large areas; hyphae or stromata hyaline; stromata reaching 80 μ in thickness; palisade of conidiophores compact, light fulvous, often 8–20 μ thick; conidia oblong-elliptical, 1-celled, hyaline, 5–10 μ × 2.5–4 μ (measurements include conidia in culture); on potato-dextrose-agar medium, thallus ochraceous tawny.

Macules vel gallas insignes, 5 mm latas, 12 mm longas, ochraceorubras, in centro ad ochraceo-alutaceas pallescentes, in caulibus et foliis producens; acervulis erumpente superficialibus, 20–50 μ in diam., saepe per superficiem latam continuis; stromatibus saepe bene evolutis, usque 80 μ crassis, hyalinis; palis conidiophorum compactis, crassis, pallide fulvis; conidiis unicellularibus, oblongo-ellipticis, hyalinis, 5–10 μ × 2.5–5 μ .

On living stems and leaves of *Aralia spinosa* L., causing a scab disease, Edgewater, Md., July 2, 1934, Peter Bisset. In the Mycological Collections of the Bureau of Plant Industry (No. 69462, type), and in Phytopathological Herbarium, Instituto Biologico, São Paulo, Brazil.

¹ Received September 14, 1937.

² JENKINS, A. E. and A. A. BITANCOURT, *Doenças das plantas causados por fungos dos generos Elsinoe e Sphaceloma*. Rodriguésia 2: (Numero especial. Annaes da Primeira Reunião de Phytopathologistas do Brasil) 305–313. 2 tables. 1936.

³ RIDGWAY, R. *Color standards and color nomenclature*, 43 pp. 1912.

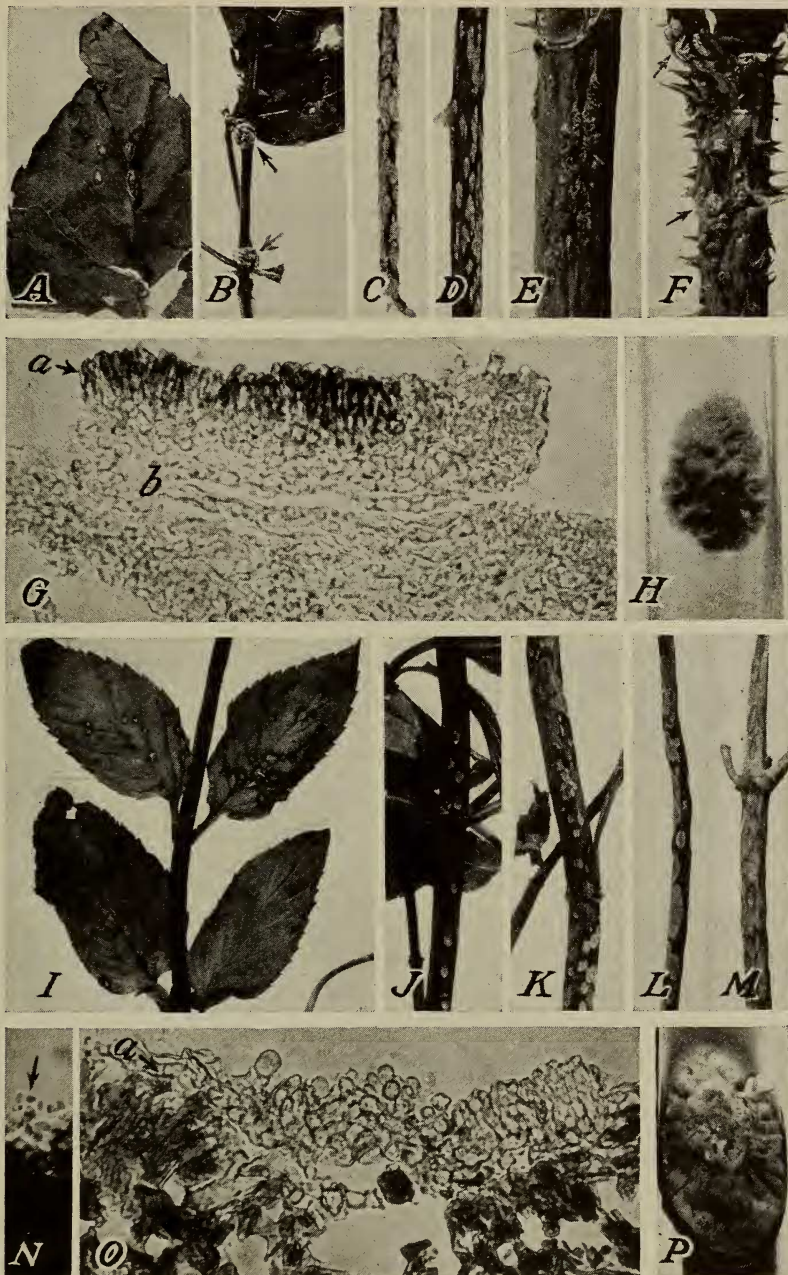


Fig. 1, A-G.—*Sphaceloma araliae* on *Aralia spinosa*. A-D, on leaf parts, E and F, on stem; G, acervulus, *a*, palisade of conidiophores, *b*, underlying stems. A-F, $\times 1$; G, $\times 400$. H, 25-day-old culture of the fungus on potato-dextrose agar. $\times 1$.
 I-O.—*S. menthae* on *Mentha piperata*. I, on leaves, J-N, on stems, M, on rootstock; N, conidia, and O, acervulus on upper surface of leaf; I-M, $\times 1$; N and O, $\times 400$. P, old culture on oatmeal agar. $\times 1$.

Sphaceloma menthae sp. nov.

Produces spots on leaves, stems and rootstocks; spots often numerous, raisin black, central part becoming pallid to pale vinaceous drab, circular to elliptical or irregular, up to 3–5 mm in diam.; stem lesions at first sunken, sometimes elevated, often becoming crateriform with concavity light-colored; acervuli erumpent superficial, more or less hemispherical or flattened, 15–80 μ or more in diam.; palisade of conidiophores compact, very light yellow, 10–25 μ thick; conidia spherical to elliptical, hyaline, 3–8 μ \times 2.5–4 μ . Characters of thallus in culture resembling those of *Myriangium*. Color of young thalli on potato dextrose agar medium Varley's brown surrounded by Hay's maroon, older pubescent thalli pallid to light brownish drab, medium becoming light yellowish olive (Fig. 1, I-P).

Maculis numerosis, in foliis, caulibus et radicibus, purpureo-nigris, in centro pallidis ad pallide vinaceo-griseis, ellipticis vel rotundis vel irregularibus, 3–5 mm in diam., vel in caulibus interdum extensis et saepe crateriformibus; acervulis erumpente superficialibus, 15–80 μ in diam. vel amplioribus; palis conidiophorum compactis, 10–25 μ crassis; conidiis sphaericis ellipticisve, hyalinis, 3–8 \times 2.5–4 μ .

On leaves, stems, and rootstocks of cultivated *Mentha piperata* L., causing the disease known as leopard spot, Lafayette, Ind., Aug. 21, 1934, R. C. Baines; Breeman, Ind., Sept. 1, 1937, H. A. Edson; *Mentha*, Mich., Aug. 3, 1937, Ray Nelson and Anna E. Jenkins; and July 31, 1935, and Aug. 20 and 29 (type), 1937, Ray Nelson. Type in the Mycological Collections of the Bureau of Plant Industry (No. 72538). Portions of the type collection also deposited in the following herbaria: Farlow Cryptogamic Herbarium of Harvard University, New York Botanical Garden, Herbarium of the University of Michigan, and the Phytopathological Herbarium, Instituto Biologico de São Paulo, Brazil.

PALEOBOTANY.—*Fossil legumes from Bridge Creek, Oregon*.¹ ROLAND W. BROWN, U. S. Geological Survey.

The reddish shales occurring along Bridge Creek, 9 miles northwest of Mitchell, Ore., and recognized as equivalent to the upper part of the Clarno formation (Oligocene, according to the usage of the U. S. Geological Survey), have long been noted for the abundant and well-preserved fossil plants they carry. This flora, together with that from similar rocks of the same or approximately the same age and horizon in the Crooked River basin, 35 miles southward, includes ferns, pines, firs, sequoias, cattails, willows, sweet-ferns, hazelnuts, hornbeams, ironwoods, alders, beeches, chestnuts, oaks, hickories, elms, hackberries, barberries, umbellularias, sycamores, mock-oranges, service-berries, hawthorns, lindens, black-gums, sweet-gums, dogwoods, and madrones. Although this flora is, relatively speaking, fairly large and well known, it is nevertheless possible to find new species, even among the old collections, as was my good fortune recently when, for other reasons than looking for a new species, I had

¹ Received July 29, 1937.

occasion to split a piece of the shale from Bridge Creek. To my surprise the unusually fine legume pod illustrated in Fig. 1 was uncovered. This pod belongs to a species of *Cladrastis*, a genus hitherto unreported from Bridge Creek, and may be described as

Cladrastis oregonensis Brown, n. sp.

Fig. 1

Description.—A linear-compressed pod, 6.5 cm long and 1.2 cm wide, with acute apex and base, the latter surrounded by the remains of the campanulate calyx. The placental suture line is marked by a wide keel or wing, but the other margin does not appear to be appreciably winged. One large

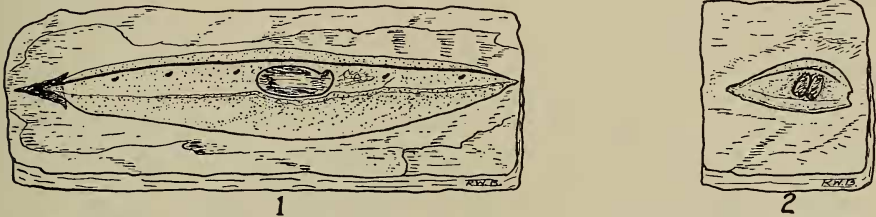


Fig. 1.—*Cladrastis oregonensis* Brown, n. sp. Fig. 2.—*Micropodium ovatum* (Lesquereux) Brown, n. comb. Both specimens are from the reddish shales along Bridge Creek, 9 miles northwest of Mitchell, Ore. Natural size.

oblong seed, 1 cm long and 5 mm wide, has a position near the center of the pod. It is attached at the upcurved end to the placenta, the free rounded end pointing backward to the base of the pod so that the long axis of the seed is parallel to the placental line. Five minute aborted seeds of the same shape as the large seed are also present. Only a faint suggestion of reticulate veining is preserved on the pod in the region near the large seed.

Occurrence.—In reddish shales along Bridge Creek, 9 miles northwest of Mitchell, Ore.

Type.—Deposited in the U. S. National Museum.

Remarks.—The characters displayed by this fossil pod are distinctive and indicate the genus *Cladrastis*. Confusion might be made with the pods of *Robinia*, which resemble those of *Cladrastis* closely, but the pods of *Robinia* are in general blunter at both ends, and its seeds are about two-thirds the size of those of *Cladrastis*, with their long axes somewhat oblique to the placental line. I have, however, been unsuccessful in matching the fossil exactly with typical pods from any of the 4 or 5 living species of *Cladrastis*. Most of the pods of *C. lutea*, the yellow-wood of a restricted area in the southeastern United States, have a comparatively narrow wing along the placental suture. The other species are natives of eastern Asia, and among these the best matches for the fossil are the pods of *C. amurensis*, which compare well in wing characters but are somewhat more rounded at the apex.

The leaves of *Cladrastis* are odd-pinnate, with leaflets that vary from broadly oval in *C. lutea* to oblong and lanceolate in some of the Asiatic species. It would seem that a scrutiny of the more or less doubtfully assigned

fossil leaves from Bridge Creek might give a clue to the probable affinity of the fossil pod with living species of *Cladrastis*. At least two kinds of such leaves, present in the collections, may be leguminous. They are the leaves identified as *Fraxinus denticulata* Heer?² and some of those originally called *Fraxinus integrifolia* Newberry³ but now *Umbellularia oregonensis* (Knowlton and Cockerell) Chaney.⁴ The enlarged petioles and the secondary venation of *Fraxinus denticulata* can be matched fairly closely in some of the leaflets of *Cladrastis lutea* and some Asiatic species of *Cladrastis*. As for *Umbellularia oregonensis*, there seems to be little question that most of the leaves assigned to that species are *Umbellularia*. However, among these leaves in the collection at the U. S. National Museum are some that in shape, venation, and enlarged petioles resemble the lanceolate leaflets of *Cladrastis amurensis*. Thus, with two sets of leaves or leaflets as possible candidates for sharing specific relationship with the fossil pod, apparently no satisfactory conclusion can be drawn, and the question as to what leaflets go with the pod must wait for solution upon the finding of further evidence.

Among fossil species the pod called *Leguminosites* sp. by Dorf,⁵ may be compared with *Cladrastis oregonensis*, but it has wide wings on both margins and thus resembles the living *C. platycarpa* of Japan. This pod also belongs to a later geologic horizon than *C. oregonensis*. The pod described as *C. eocenica* Berry⁶ from the Eocene of Tennessee may belong to *Cladrastis*, but as figured it does not show the shape and posture of the seeds and thus fails to be entirely convincing.

Two other kinds of leguminous pods have been described from the shales of Bridge Creek and Crooked River, Ore. One of these is *Cercis* sp. from Crooked River.⁷ This is the distal half of a pod showing a thick suture line and three elliptic to circular seeds. The shape of these seeds clearly distinguishes this pod from *Cladrastis oregonensis*. LaMotte⁸ has synonymized *Cercis* sp. with *Cercis spokaneensis* Knowlton⁹ from the Latah formation. It seems to me, however, that La-

² NEWBERRY, J. S. *The later extinct floras of North America*. U. S. Geol. Survey Mon. 35: 128, pl. 49, fig. 6, 1896.—CHANNEY, R. W. *Geology and paleontology of the Crooked River Basin, with special reference to the Bridge Creek flora*. Carnegie Inst. Wash. Pub. 346 (pt. 4): 132, pl. 19, figs. 5–7, 1927.

³ NEWBERRY, J. S. *Op cit.*, p. 128, pl. 49, figs. 1–3.

⁴ CHANEY, R. W. *A record of the presence of Umbellularia in the Tertiary of the western United States*. Carnegie Inst. Wash. Pub. 349 (pt. 4): 60, pl. 1, figs. 1, 3, 5, 7, 1925.

⁵ DORF, ERLING. *A late Tertiary flora from southwestern Idaho*. Carnegie Inst. Wash. Pub. 476 (pt. 2): 119, pl. 3, fig. 1, 1936.

⁶ BERRY, E. W. *Revision of the lower Eocene Wilcox flora of the southeastern States*. U. S. Geol. Survey Prof. Paper 156: 84, pl. 41, fig. 12, 1930.

⁷ CHANEY, R. W. *Op cit.*, Pub. 346 (pt. 4): 125, pl. 15, fig. 5, 1927.

⁸ LAMOTTE, R. S. *The upper Cedarville flora of northwestern Nevada and adjacent California*. Carnegie Inst. Wash. Pub. 455 (pt. 5): 132, pl. 10, fig. 4, 1936.

⁹ KNOWLTON, F. H. *Flora of the Latah formation of Spokane, Washington, and Coeur d'Alene, Idaho*. U. S. Geol. Survey Prof. Paper 140: 43, pl. 29, fig. 9, 1926.—BROWN, R. W. *Additions to some fossil floras of the western United States*. U. S. Geol. Survey Prof. Paper 186: 177, pl. 54, figs. 10–12, 1937.

Motte's figured specimen from 49 Camp, Washoe County, Nev. is not *C. spokanensis*, nor is it the same species as the Crooked River specimen, for the latter appears to be more membranous and lacks the wide wings on the margins. The other species of pod is that originally called *Ailanthus ovata* Lesquereux but now

Micropodium ovatum (Lesquereux) Brown, n. comb. Fig. 2

Ailanthus ovata Lesquereux, U. S. Geol. Survey Terr. Rept. 8:254, pl. 51, figs. 7, 8. 1883. [Fig. 8 is a branch, probably unidentifiable, and therefore not further considered here.]

Knowlton, U. S. Geol. Survey Bull. 204: 69. 1902.

Description.—Small oblong-ovate pods, rounded at the apex, acute at the base, 1.5 cm long and 8 mm wide, with a broad wing on the placental suture line. In Fig. 2 the apex is broken and the base is slightly eroded. Seeds apparently one to several, elliptic, 2 mm long, with the long axis perpendicular to the placental line. No venation appears to be present on the specimens. Such markings or striations as have been reported seem to have been caused by the processes of fossilization.

Occurrence.—In reddish shales along Bridge Creek, 9 miles northwest of Mitchell, Ore.

Type.—The original figured specimens are at the University of California. Fig. 2 is in the U. S. National Museum.

Remarks.—These small pods are obviously those of a species of legume and not of *Ailanthus*, for they show neither the longitudinal veins and reticulations, nor the small notch or emargination that is usually present on the wing beneath the seed of *Ailanthus*. Characteristic samaras of *Ailanthus americana* Cockerell are present in the flora from the Green River formation and in that from the Florissant lake beds but they can be distinguished readily from these pods.

Because of their nearly uniform small size these pods seem to represent a single species distinct from that called *Cercis* sp. by Chaney, referred to above. Although *Cercis* leaves are known from the Florissant lake beds, the Latah formation, and other strata in the regions adjacent to the John Day Basin of Oregon, none have yet been identified as such from the shales of Bridge Creek and Crooked River in the latter area. Nevertheless *Cercis* sp. appears to be a true *Cercis*. It is possible that the small pods under discussion here may be the dwarf pods of that species, but until more conclusive evidence appears it seems desirable to regard them as distinct and to adopt Saporta's generic name for similar pods from the Tertiary of southeastern France, his type being *Micropodium oligospermum*.¹⁰ Saporta himself found it difficult to distinguish his specimens from *Cercis* but concluded that because they were apparently produced in a raceme they should be considered as belonging to a different genus. If these fruits were produced in a raceme it is possible that they too may represent *Cladrastis*, resembling the smaller

¹⁰ SAPORTA, G. DE. *Études sur les végétation du sud-est de la France à l'époque tertiaire*. 1: 137, pl. 14, figs. 8A, 8B, 1863.—Suppl. 1. *Révision de la flore des gypses d'Aix*. 3: 221, pl. 18, fig. 1, 1873.